Threat and Consequence Assessment

The Threat and Consequence Assessment Division (TCAD) provides guidance and scientific expertise to aid in preparing for and responding to terrorist events.

TCAD's Mission

The Threat and Consequence Assessment Division conducts risk assessment research to assist emergency responders, decision makers, and government officials in the event of a terrorist attack.

Tools Development

To improve the ability to make risk-based decisions in the field or in an emergency operations center, TCAD is developing new tools and enhancing existing tools.

- **Emergency Consequence Assessment Tool (ECAT)** The ECAT combines the decision making processes of the emergency response and risk assessment paradigms into a tool that provides for rapid communication and informed risk management for nontraditional contaminants. The pilot program is scenario-based.

- **Enhanced Public Health Surveillance Systems** TCAD is working with RODS and ESSENCE to incorporate water quality data and water utility consumer complaints into their nationally available syndromic surveillance programs.
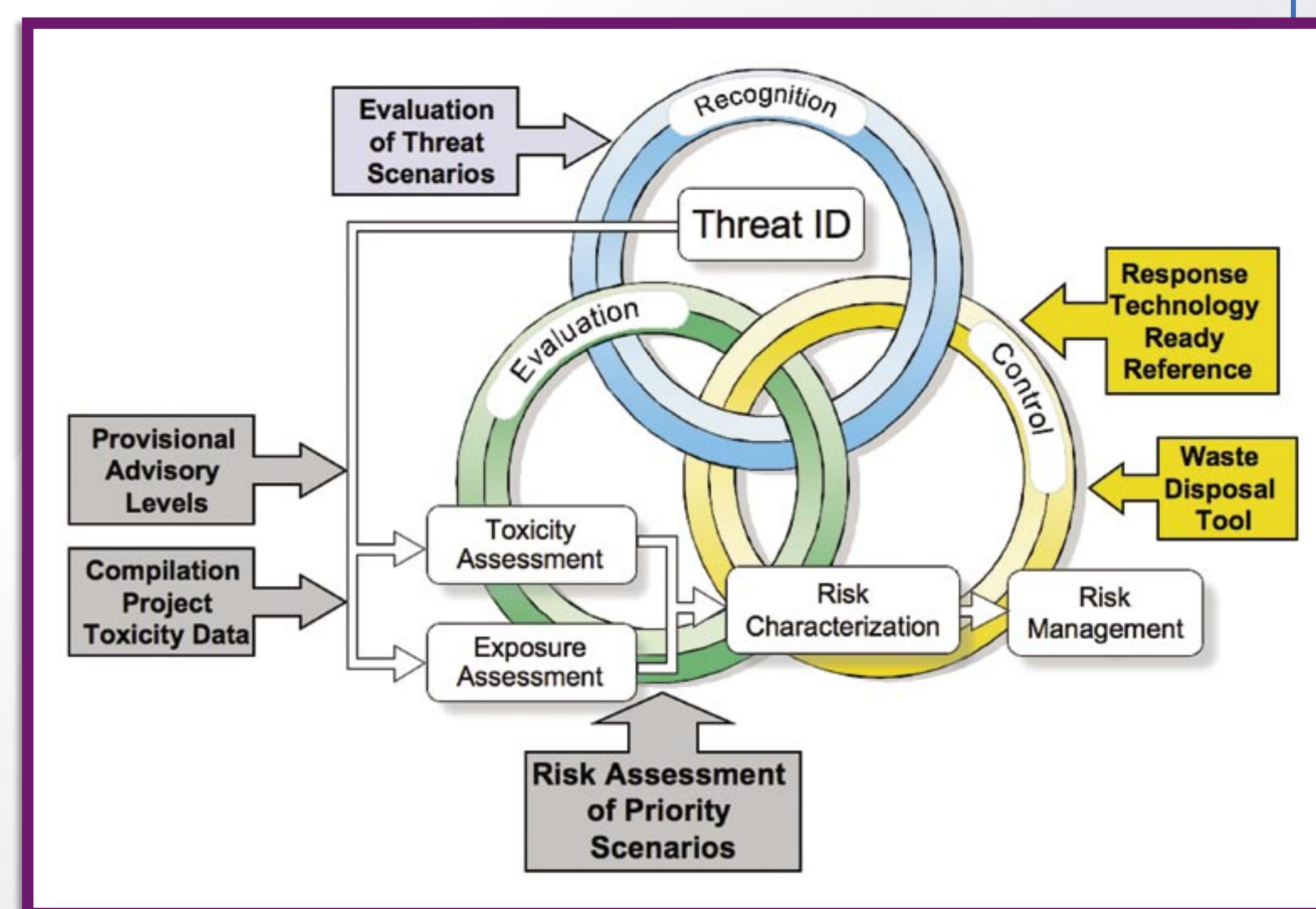
- **Message Maps** These highly acclaimed risk communication tools deliver the most pertinent information regarding an emergency situation quickly and concisely. TCAD is helping stakeholders in the responder and environmental communities develop message maps for terrorist threats.

Methods Development

TCAD conducts research on new or modified methodologies to enable rapid evaluation and estimation of risks during a terrorist incident involving biological, chemical, or radiological agents. Key projects include:

- research to develop microbial risk assessment
- methods to assess effects of subchronic exposures
- methods to incorporate less-than-optimal data into risk assessments
- methods and models to apply quantitative structure activity relationships

Microbial risk assessment

Currently there is no consensus-based methodology for evaluating biological contaminants and establishing clean-up levels. TCAD is embarking on a progressive microbial risk assessment (MRA) program evaluating the strengths and weaknesses of existing biological risk assessment methods and tools. Researchers are focused on assembling known microbial risk data from the limited human and animal dose-response studies to identify data gaps for future research and to develop model-based quantitative risk assessment tools for stakeholders.

Determining "How Clean Is Clean?"

- "How clean is clean?" is a longstanding question; however, our national homeland security interests have added an increased urgency to finding the answer.

- TCAD is working with stakeholders to develop provisional risk-based guidance level goals for biological and chemical agents.

- TCAD's multitiered approach involves initiating new research to determine exposure levels where data do not currently exist, expanding existing extrapolation methodologies, and investigating the possible use of modified exposure pathways.

Selected TCAD Research Projects

- Development of Compendium of Prior and Current Microbial Risk Assessment Methods and Approaches as a Basis for Selection, Development, and Testing of Preliminary Microbial Risk Assessment Methodologies

- Exposure Assessment for Pathogens Aerosolized by Showering, Boiling, Splashing, and Misting of Water from Various Exposure Pathways

- Development and Application of Improved Infectious Disease Transmission Models Integrated with Population Dynamics to More Accurately Assess Direct and Indirect Risk of Infection on a Temporal Basis Resulting from Deliberate Biological Contamination

- Document Collection and Evaluation from Department of Defense Sources to Provide EPA with Secondary Data of Key Organism Specific Characteristics for Biological Agents

- Development of Statistically-Based Quantitative Structure-Toxicity Relationship (QSTR) Models for Predicting the Chronic Lowest Observed Adverse Effect Level (LOAEL) Endpoint for a Variety of Chemicals

- Evaluation and Validation of Indoor Air Dispersion Models